

Mammalia, Rodentia, Sigmodontinae Wagner, 1843: New Locality records, filling gaps and geographic distribution maps from La Rioja province, northwestern Argentina

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ABSTRACT: Sigmodontine rodents are well represented in northwestern Argentina, but information regarding their distribution in La Rioja is scarce. We add new information for seven species from seven localities in the Famatina range. These new records were obtained using both captures and owl pellet analysis. We cite the first record of *Neotomys ebriosus* in La Rioja. The collection locality is unusual for this species because of its low altitude and xeric conditions. Other notable results include the second record of *Abrothrix andinus* and of the genus *Oligoryzomys* at the province.

The sigmodontines are a highly diversified group of small to medium-sized rodents with a predominantly South American distribution (D'Elía 2003). This group is well represented in northwestern Argentina (NWA), with approximately 30% of the mammals in the region belonging to this taxon (Jayat *et al.* 2011). In recent years the availability of data for the distribution of sigmodontines in NWA has increased notably, but the geographic ranges of many species are still poorly known (Jayat *et al.* 2011).

La Rioja, at the southern end of the NWA region, is one of the lesser known Argentinean provinces in regard to sigmodontine distributions, with very few publications in existence. Some of the contributions that do exist contain outdated information (*e.g.*, Thomas 1920; Yepes 1936), while most others report on only a small number of species and/or localities (*e.g.*, Massoia *et al.* 1999; Lanzone *et al.* 2005; Mares *et al.* 2008; Martinez *et al.* 2010).

In this contribution, we provide new distributional information for seven species, from seven localities in central La Rioja province, thereby filling a significant information gap for representatives of the tribes Abrotrichini, Akodontini, Oryzomyini, Phyllotini, and one Sigmodontinae *incertae sedis*. These new records were obtained during field surveys conducted in October 2009 and between May and August 2010 using both captures (139 specimens from 900 traps/night) and owl pellet analysis (381 individuals from 208 pellets). All of the new localities, along with their coordinates, are listed in the gazetteer of the appendix 1, and their locations are shown in Figure 1.

The material collected was taxonomically identified by comparison with reference specimens from Argentine museums (Colección Mamíferos Lillo, Tucumán, and Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires), as well as with bibliographic sources (*e.g.*,

Pearson 1958; Hershkovitz 1962; Myers 1989; Jayat *et al.* 2010).

Captured specimens were recorded in the personal catalogue of the two lead authors (JPJ, PEO), and voucher specimens were deposited at the Museo Argentino de Ciencias Naturales (MACN) and the Mammal Collection of the Centro Nacional Patagónico, Puerto Madryn, Argentina (CNP). Owl pellet samples were recorded in the personal catalogue of P. E. Ortiz (PEO- e) and were entered into the pellets collection of the Centro Nacional Patagónico (CNP-E). The ecoregions classification used in this article follows Burkart *et al.* (1999).

Recorded Species

Family Cricetidae Fischer, 1817

Subfamily Sigmodontinae Wagner, 1843

Tribe Abrotrichini D'Elía, Pardiñas, Teta, and Patton, 2007

Abrothrix andinus (Philippi, 1858)

Specimens examined: Cueva de Díaz, Sierra de Famatina, 3200 m (MACN 24042); El Pesebre, 2448 m (CNP-E 601-2) (Figure 2).

Comments: some authors have considered *Akodon gossei* Thomas, 1920 (cited for La Invernada, La Rioja, by Thomas [1920]) as a junior synonym of *Abrothrix andinus*, (*e.g.*, Mann Fisher 1978), but recent revisions indicate that this position must be reevaluated (Teta *et al.* 2006). Following Mann Fisher (1978), our new record would represent the second mention of *A. andinus* from a vast area between central Catamarca province (Mares *et al.* 1997) and northern Mendoza province (Contreras and Rosi 1981). El Pesebre represents the first record for this

species from the Monte de Sierras y Bolsones ecoregion (see Teta *et al.* 2006).

Tribe Akodontini Vorontsov, 1959

Akodon sp.

Specimens examined: Cuarta Estación, Mina La Mexicana, 2400 m (CNP-E 604-2); El Túnel, approx. 1 km NNW of the Cuarta Estación, Mina La Mexicana, 2500 m (CNP-E 603-2); Tercera Estación, Mina La Mexicana, 1950 m (CNP-E 602-2) (Figure 2).

Comments: the morphometric values recorded for this material, obtained from owl pellets, agree closely with those seen in species of the *Akodon varius* group (*e.g.*, upper and lower molar series 5.08 [n: 4] and 5.19 mm [n: 6], respectively; Myers 1989). The specimens studied have some characteristics similar to those of *Akodon simulator* Thomas, 1916 but this species has not yet been recorded in environments as xeric as those of the collection localities presented here (see Myers 1989 and Braun *et al.* 2008). Because of the scarcity of the material analyzed and the absence of reference specimens from this province, only taxonomic assignation to the genus level can be made with confidence. Only two representatives of the *A. varius* group have been previously recorded from this province; *A. simulator*, from the extreme north (Thomas 1920; Jayat *et al.* 2007), and *A. varius* Thomas, 1902 from the south (Massoia *et al.* 1999). However, the *A. simulator* records are from environments close to the southern extreme of Yungas forest (in Cuesta de la Cébila, near the Catamarca-La Rioja provincial border), and *A. varius* was excluded

of the mammalian fauna of Argentina (see Pardiñas *et al.* 2006, and Braun *et al.* 2008). We reject the hypotheses that these specimens belong to *Akodon dolores* Thomas, 1916 on the basis of the narrower and more hypsodont molars seen in these *Akodon* sp. specimens. Furthermore, *A. dolores* has not been previously recorded above 1300 m altitude, with all its records situated in Chaco Seco and Espinal environments (Polop 1991; Pardiñas *et al.* 2006). All the three localities of Famatina's specimens are situated in a very different environment (Monte de Sierras y Bolsones-Altos Andes ecotone).

Akodon spegazzinii Thomas, 1897

Specimens examined: Cuarta Estación, Mina La Mexicana, 2400 m (CNP-E 604-3); Cueva de Díaz, Sierra de Famatina, 3200 m (MACN 24040); El Pesebre, 2448 m (CNP-E 601-3); El Túnel, approx. 1 km NNW of the Cuarta Estación, Mina La Mexicana, 2500 m (CNP-E 603-3); Tercera Estación, Mina La Mexicana, 1950 m (CNP-E 602-3) (Figure 2).

Comments: although most of the existing records for *A. spegazzinii* come from NWA, its known range was recently extended far to the south, reaching southern Mendoza (Jayat *et al.* 2010; Pardiñas *et al.* 2011). Until now there were only two localities where this species had been recorded in La Rioja (La Invernada and Potrerillo by Thomas [1920] as *Akodon alterus* Thomas, 1919). *Akodon alterus* was recently considered to be a junior synonym of *A. spegazzinii* (Jayat *et al.* 2010).

Tribe Oryzomyini Vorontsov, 1959

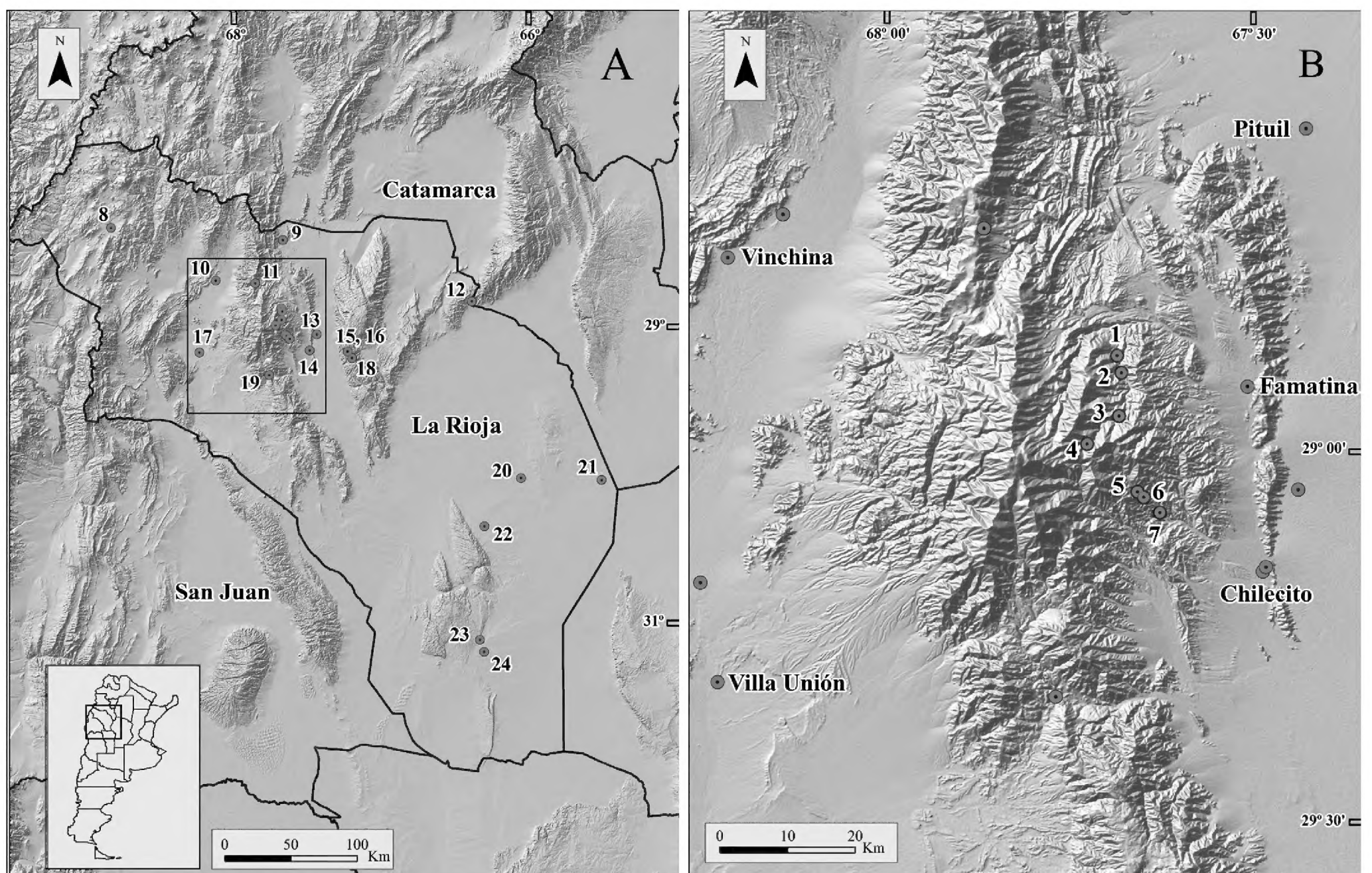


FIGURE 1. Collection localities for sigmodontine rodents in La Rioja province. Left: general view of the study area. Right: detail showing the locations of the sigmodontine records from the Famatina range. Green dots: records obtained from the literature; red dots: new records; blue dots: larger cities in the region. Numbers correspond to those in the appendices.

***Oligoryzomys* sp.**

Specimens examined: Tercera Estación, Mina La Mexicana, 1950 m (CNP-E 602-7) (Figure 2).

Comments: the single mandible collected belongs to one of the large species of *Oligoryzomys* (length of molar series = 4.15 mm), but the unresolved taxonomic status of these forms, as well as the scarcity and fragmentary condition of the material obtained, prevent a species-level identification. There is one existing record for this genus from La Rioja (Massoia *et al.* 1999 as *Oligoryzomys chacoensis* Myers and Carleton, 1981), but this species is currently recognized in Argentina only for some northern provinces (Cirignoli *et al.* 2006).

Tribe Phyllotini Vorontsov, 1959

***Calomys musculus* (Thomas, 1913)**

Specimens examined: Cuarta Estación, Mina La Mexicana, 2400 m (CNP-E 604-4); Cueva de Díaz, Sierra de Famatina, 3200 m (MACN 24039) (Figure 2); El Pesebre, 2448 m (CNP-E 601-4); El Túnel, approx. 1 km NNW of the Cuarta Estación, Mina La Mexicana, 2500 m (CNP-E 603-4); Tercera Estación, Mina La Mexicana, 1950 m (CNP-E 602-4).

Comments: in spite of its broad distributional range, *Calomys musculus* was previously recorded in La Rioja at only two localities, both in southern areas of the province (Massoia *et al.* 1999).

***Phyllotis xanthopygus* (Waterhouse, 1837)**

Specimens examined: Cañón del Ocre, 2750 m (CNP 2405); Cuarta Estación, Mina La Mexicana, 2400 m (CNP-E 604-7); Cueva de Díaz, Sierra de Famatina, 3200 m (MACN 24041); Cueva de Perez, 3800 m (MACN 24038); El Pesebre, 2448 m (CNP-E 601-5); El Túnel, approx. 1 km NNW of the Cuarta Estación, Mina La Mexicana, 2500 m (CNP-E 603-7); Tercera Estación, Mina La Mexicana, 1950 m (CNP-E 602-8) (Figure 2).

Comments: recorded in La Rioja at eight localities, only two of them in the Famatina range (Ferro *et al.* 2010). We found this species in seven localities ranging from 1950 to 3800 m in elevation, in Monte de Sierras y Bolsones and Altos Andes ecoregions.

Sigmodontinae *incertae sedis*

***Neotomys ebriosus* Thomas, 1894**

Specimens examined: Cueva de Díaz, Sierra de Famatina, 3200 m (CNP-E 605-4); Cuarta Estación, Mina La Mexicana, 2400 m (CNP-E 604-6); El Túnel, approx. 1 km NNW of the Cuarta Estación, Mina La Mexicana, 2500 m (CNP-E 603-6); Tercera Estación, Mina La Mexicana, 1950 m (CNP-E 602-6) (Figure 2).

Comments: there are no previously published records of *Neotomys ebriosus* in La Rioja. These new records fill an existing information gap of about 350 km between Barranca Larga, Catamarca (Ortiz *et al.* 2000; Pardiñas and Ortiz 2001) and the Reserva Provincial San Guillermo in San Juan province (Barquez 1983). At 1950 m, the Tercera Estación locality also provides the lowest known altitude record for this species, which had been previously recorded only above 2400 m (*e.g.*, Ortiz *et al.* 2000; Pardiñas and

Ortiz 2001; Jayat *et al.* 2008). This locality also represents the second record of the species in the Monte de Sierras y Bolsones.

Studies regarding sigmodontine distributions in NWA have a long history, but much of the older information is either outdated or has not yet been critically evaluated (Jayat *et al.* 2011). However, in recent years the subject has begun to receive more dedicated attention, and several recent contributions have added significantly to the state of accumulated knowledge (*e.g.*, Díaz *et al.* 2000; Ortiz *et al.* 2000; Jayat and Pacheco 2006; Jayat *et al.* 2006, 2008, 2009, 2010, 2011; Teta *et al.* 2007; Ferro and Barquez 2008).

For La Rioja province in particular, previous information regarding sigmodontine distributions was based upon records from only 18 localities (Appendix 2 and Figure 1), with only two of these located in the Famatina range. Six of those localities (including those for the Famatina) were published before 1940 (Thomas 1896, 1920; Yepes 1936) and the remaining only added eight species to the province (*e.g.*, Blaustein *et al.* 1992; Massoia *et al.* 1999; Ojeda *et al.* 2001; Catanesi *et al.* 2002; Lanzone *et al.* 2005; Mares *et al.* 2008). Most of these localities represent a picture of sigmodontine fauna characteristic

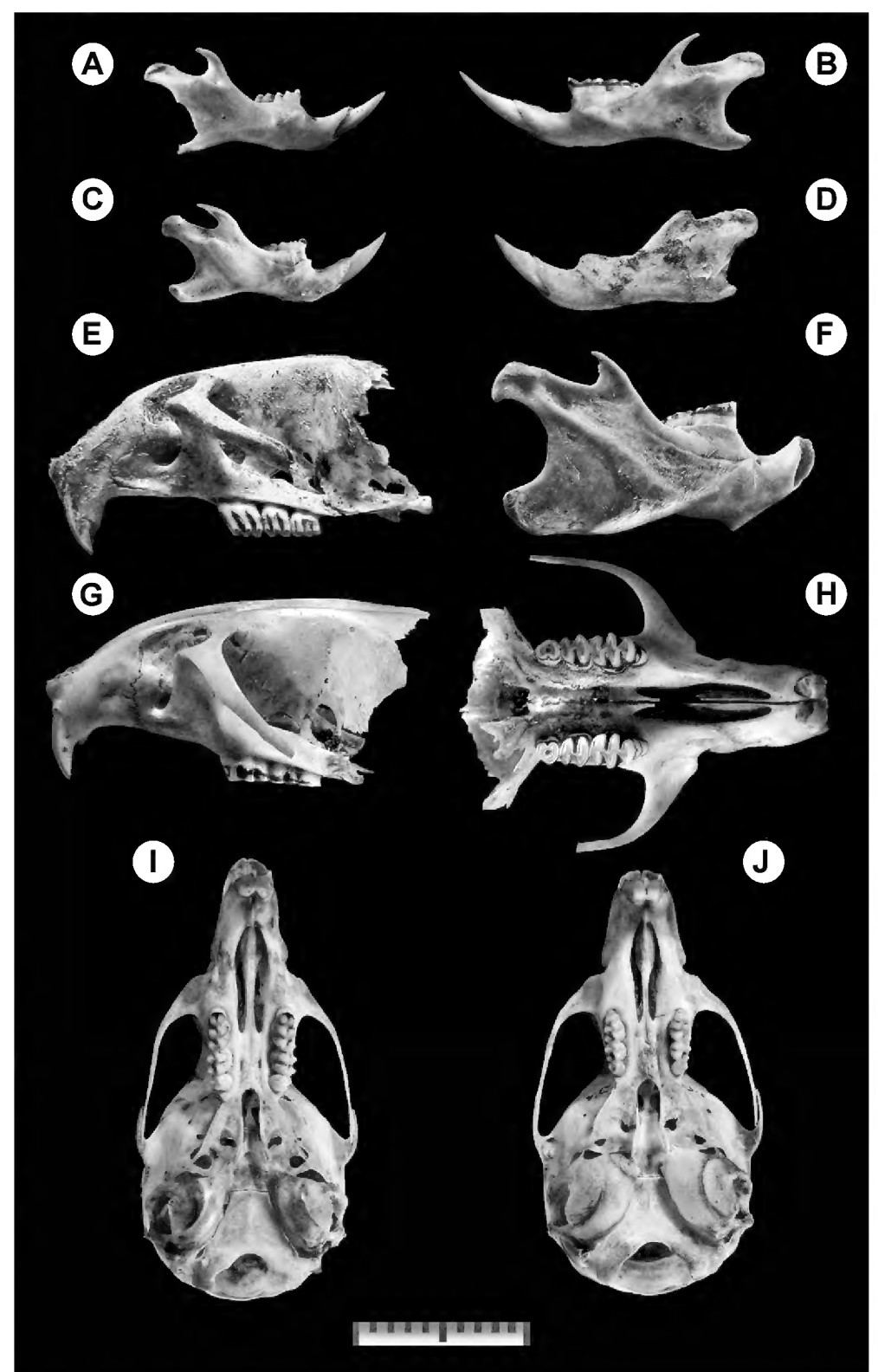


FIGURE 2. Skull and mandible elements of the specimens recorded from the new localities: A and J, *Abrothrix andinus*; B, *Akodon* sp.; C, *Calomys musculus*; D, *Oligoryzomys* sp.; E and F, *Neotomys ebriosus*; G and H, *Phyllotis xanthopygus*; I, *Akodon spegazzinii*. Scale bar = 10 mm.

of low elevation environments of Chaco Seco and Monte de Sierras y Bolsones. In this context, almost all of the new data presented here represent novel contributions, especially since they come from localities situated along a wide altitudinal gradient (1950–3800 m) of Altos Andes environments situated on the prominent Famatina mountain range.

Previously, only three sigmodontines were documented from the Famatina range (*Abrothrix andinus*, *Akodon spegazzinii*, and *Phyllotis xanthopygus*). The new records here presented document the presence of four additional species (*Akodon* sp., *Calomys musculinus*, *Oligoryzomys* sp., and *Neotomys ebriosus*). Particularly interesting among these is the first record of *Neotomys ebriosus* in La Rioja, at a relatively low elevation and in a Monte de Sierras y Bolsones environment. This species has previously been recorded mainly above 3000 m elevation and in association with wetter environments like “vegas” in Altos Andes and Puna ecoregions (Pardiñas and Ortiz 2001). Recent research has also located this species in relatively wet high-altitude Yungas grasslands (Díaz et al. 2000; Jayat et al. 2008), with the record reported here being only the second from Monte environments (Ortiz et al. 2000; Pardiñas and Ortiz 2001). Other notable results are the second records from the province of *Abrothrix andinus* and the genus *Oligoryzomys*. However, these two taxa, as well as the *Akodon* sp. specimens, still require more definitive taxonomic identification.

Based upon consideration of all the available information regarding sigmodontine distributions (Barquez et al. 2006), La Rioja appears to show a greater affinity with the rest of NWA than with Mendoza and San Luis, in the Cuyo region. This is because the sigmodontine communities in Mendoza are clearly influenced by the presence of species associated with Bosques Patagónicos and Estepa Patagónica environments (e.g., *Abrothrix longipilis*, *A. olivaceus*, *Chelemys macronix*, *Euneomys chinchilloides*, *E. mordax*, *Loxodontomys micropus*), and those of San Luis by species associated with the Pampa and Espinal (e.g., *Akodon molinae*, *Oxymycterus rufus*). However, it is more difficult to draw conclusions regarding San Juan, since its sigmodontine fauna remains poorly studied.

To complement the new records presented here, similar surveys mainly centered on areas of Chaco Serrano, Altos Andes and Puna, should be carried out. Several species (e.g., *Necomys lasiurus* [Lund, 1840]; *Akodon caenosus* Thomas, 1918, *Calomys lepidus* [Thomas, 1884], and *Reithrodon auritus* [Fischer, 1814]) have good probabilities of being recorded since they are present in similar environments to the north in Catamarca province.

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APPENDIX 1. Gazetteer of new localities for sigmodontine rodents in La Rioja province. The numbers in parentheses correspond to those in Figure 1.

Cañón del Ocre, 2750 m (28°54'10.6" S, 67°41'15.3" W) (2); Cuarta Estación, Mina La Mexicana, 2400 m (29°04'7.5" S, 67°39'28.5" W) (6); Cueva de Díaz, Sierra de Famatina, 3200 m (28°57'38.20" S, 67°41'27.28" W) (3); Cueva de Perez, 3800 m (28°59'52.7" S, 67°43'59.9" W) (4); El Pesebre, 2448 m (28°52'48.1" S, 67°41'35.8" W) (1); El Túnel, approx. 1 km NNW of the Cuarta Estación, Mina La Mexicana, 2500 m (29°03'41.1" S, 67°39'58.2" W) (5); Tercera Estación, Mina La Mexicana, 1950 m (29°05'20.9" S, 67°38'11.3" W) (7).

APPENDIX 2. Gazetteer of known localities for sigmodontine rodents in La Rioja province. The numbers in parentheses correspond to those in Figure 1.

12.4 km N Va. San José de Vinchina, 1681 m (28°41'30.6" S, 68°08'19.1" W) (10); 2.8 km N Chilecito, 1 km E Chilecito, 1087 m (29°03'30.9" S, 67°27'7.8" W) (13); 14.5 km N Villa Unión, 1253 m (29°10'56.1" S, 68°14'55.1" W) (17); 26 km SW Quimilo, Salinas Grandes, 581 m (30°02'43.4" S, 65°31'13.4" W) (21); 45 km NE of Chamental, Salar La Antigua, 467 m (30°02' S, 66°04' W) (20); Ambil (31°07'48.9" S, 66°20'41.1" W) (23); Chamental (30°21'40.4" S, 66°18'53.9" W) (22); Chilecito, 1000 m (29°10'3.8" S, 67°29'58.4" W) (14); Cuesta La Cébila, a km de Chumbicha, sobre ruta 60 (28°50' S, 66°54' W) (12); Desiderio Tellio (31°12'44.9" S, 66°18'59.1" W) (24); La Invernada, about 35 km north of the mountain "Nevada de Famatina", alt. 3800 m (28°42'38.2" S, 67°52'14.4" W) (11); Laguna Brava (28°20'7.9" S, 68°50'52.3" W) (8); Las Pirquitas (29°20'4.7" S, 67°46'31.3" W) (19); Potrerillo, 1600 m (28°25'01" S, 67°40'59.5" W) (9); Puesto Viejo, 2500 m (29°10'27.4" S, 67°14'34.4" W) (15); Salicas, app. 600 km northwest from Santiago Temple (28°21'57.4" S, 67°03'15.7" W); San Antonio, Sierra de Velasco, 2700 m (29°13'9.2" S, 67°12'43.9" W) (18); Velasco al oeste de puesto viejo, 2500 m (29°10'27.4" S, 67°14'34.4" W) (16).

Locality not precisely located: Cerro Famatina, 3200 m